

# Work Order ID 59904

Wednesday, June 16, 2010 1:00:38 PM



Page 1

Item ID: D350-748-101

Accept



Setup Start



Revision ID:

Item Name: Crosstube Installation, High Fwd

Stop



Start Date: 6/16/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 7/8/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: *[Signature]*

Date: *10-6-16*

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
D350-748-141	Rev E

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile & type labels per PPPD350-748-101 CHG001

*Sider/21*

*John CL 10-9-21*

110

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT *22*

*DP 10-8-5*

120

QC15- Crosstube Dimensional Check

0.00



QC

Memo

0.00

Quality Control

*Sider/12*

*Ⓢ*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130 	Crosstubes	0.00							
Crosstubes	Memo	0.00							
Crosstubes	1-Drill Tube as per Dwg D350-748-141 Using DT8876 A,B &C Drill Jigs, Set-up drill table as per QSI 010								
	2-Deburr								
	3-Engrave Part # and Batch # as per Dwg D350-748-141								
	4-Remove all marks from tube within limits of D350-748-141								
	5- Apply a light coat of LPS3 on the interior of tube Batch: 109956								
140 	QC5- Inspect part completeness to step on W/O	0.00							
QC	Memo	0.00							
Quality Control	CHECK 10 DEG HOLES WITH DT8876E (EUROCOPTER CLAMP)								

MB 10-08-16

Ann 10-05-17

8/10/06/12

40

W/O:		WORK ORDER CHANGES					
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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start  
Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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150



Outsource3

Outsource process - Cad plate

Outsource process-Cadplate per QSI017 4.1.9.1

0.00

Memo

0.00

Issue P/O: 12422  
Stress relief at 375° for 5 hours  
Magnetic Particle Inspect per ASTM E1444  
Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2  
Embrittle relief at 375° for 8 hours, Chromate Treat  
Possible Supplier: Southwest United Industries  
Ensure Certificate of Conformity is attached

CL 10/8/18 ①

160



Packaging

Packaging

Receive &amp; Inspect for Damage &amp; Mat'l Certs

0.00

Memo

0.00

Ensure certificate of conformity is attached

10/5/12 ②

170



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

ML 10 08 17 ①

P.T.O.

WIO: 59904		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
10/9/13	175	NDT per QST 038 before + after load testing per Eng. this time only P/O# 12557	CL	10/9/14	1	W 10-9-13	
		Receive + Inspect		10/9/14	1		

Part No: D350-748-101 PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Run Start  
Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180 	SprayPaint	0.00				<u>ml</u>	<u>10</u>	<u>09</u>	<u>17</u> (1)
SprayPaint	Memo	0.00							
Spray Painting	1-Prime inside crosstube as per QSI 005 4.2 2-Prime Outside of Tube as per Dart QSI 005 4.2								
190 	QC14- Inspect Spray Paint	0.00				<u>HT</u>	<u>10</u>	<u>09</u>	<u>20</u> (KT)
QC	Memo	0.00							
Quality Control	Then, Wrap in plastic bag to protect from scratches								
200 	Crosstubes	0.00				<u>ml</u>	<u>10</u>	<u>09</u>	<u>20</u> (1)
Crosstubes	Memo	0.00							
Crosstubes	1-Install Ground wire Insert, then insert screw and washer 2-Install Abraison strips as per Dwg D350-748-141 & QSI 035. 3-Install supports Using Dt8876 as per Dwg D350-748-141, Torque to 60-80 IN-LBS								

W/O:		WORK ORDER CHANGES					
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Cust Item ID:

Required Date: 7/8/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

210

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

S 10/16/20

(X)

220

Pick Kit

0.00



Packaging

Memo

0.00

Packaging

P 10/15/20 (L)

230

QC4- 100% Inspect kits for completeness

0.00



QC

Memo

0.00

Quality Control

S 10/17/21

(X)

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Required Date: 7/8/2010 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start  
Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240	Packaging	0.00							
	Packaging								
	Packaging								
	Memo	0.00							
	Identify and pack for shipping as per PPP D350-748-101								
	Location: _____								
	PPP Rev: _____								
250	QC21- Final Inspection - Work Order Release	0.00							
	QC								
	Quality Control								

10/9/21

WF  
10-9-21

W/O:		WORK ORDER CHANGES					
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# Picklist Print

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Page 1

Work Order ID: 59904

Parent Item: D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 6/16/2010

Required Date: 7/8/2010

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A New Issue 06-07-05 JLM  
 IPP Rev:B Update qty of MS21042L5 06-09-12 KJ  
 IPP Rev:C Rev B 07-11-15 DD  
 IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD  
 IPP Rev:E 08-06-24 revD as per dwg DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
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D350-748-141TRN Manufactured No



Crosstube Turning Detail

Location	Loc Qty	Loc Code
LG B59327 ①	5	
55295	1	
55297	1	
55298	1	
55299	1	
55300	1	

DP 10-8-5

ALS4-1032-225 Purchased No



Insert

Location	Loc Qty	Loc Code
PK011	6529	
110768	6529	

AN960JD10 NAS1149D0363J Purchased No



Washer

B# 105792

ml 10-09-20

ml 10-09-20

W/O:		WORK ORDER CHANGES					
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Page 2

Work Order ID: 59904

Parent Item: D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 6/16/2010

Required Date: 7/8/2010

Start Qty: 1.00

Required Qty: 1.00

D2856-400

Manufactured No

200 f

238.2388 1.181 1.243158



Abraison Strip



ml 10 09 20

## Location

## Loc Qty

## Loc Code

ST403

238.2388

50593

43.4568

56626

194.782

D3500-1

Manufactured No

200 Each

32.0000 4 4 ✓



Saddle



6/20 6/15/20

## Location

## Loc Qty

## Loc Code

ST425

32

52326

6

55605

26

D3502-1

Manufactured No

200 Each

64.0000 2 2



Support



ml 10 09 20

## Location

## Loc Qty

## Loc Code

ST066

64

47120

1

50287

38

52903

25

MS21920-20

Purchased No

200 Each

101.0000 2 2



Clamp (per MIL-DTL-8783C)



ml 10 09 20

## Location

## Loc Qty

## Loc Code

LG

101

112624

24

112793

3

114687

50

114779

24

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Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES					
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Start Date: 6/16/2010

Required Date: 7/8/2010

Start Qty: 1.00

Required Qty: 1.00

MS27039-1-10

Purchased

No

200

Each

137.0000

1

1



Screw



ml 10.09.20

Location

Loc Qty

Loc Code

ST291

137

112794

37

112940

100

AN4-41A

Purchased

No

220

Each

226.0000

8

8



Bolt



ml 10.09.20

Location

Loc Qty

Loc Code

ST360

226

111424

26

113359

100

114941

100

AN4-6A

Purchased

No

220

Each

1,121.000

16

16



Bolt



ml 10.09.20

ml 10.09.20

Location

Loc Qty

Loc Code

ST356

1121

112933

96

113149

522

114523

2

114615

1

114941

500

ml 10.09.20

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Shop Packet Print

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Required Date: 7/8/2010

Start Qty: 1.00

Required Qty: 1.00

AN5-32A Purchased No 220 Each 178.0000 4 4  
Bolt

Location	Loc Qty	Loc Code
ST340	178	
113121	28	
114056	100	
114405	50	

AN9603D416 NAS1149D0463J Purchased No 220 Each 18.0000 32 32  
Washer

Location	Loc Qty	Loc Code
ST357	18	
107939	18	

AN9603D516 NAS1149D0563J Purchased No 220 Each 0.0000 8 8  
Washer

D3501-1 Manufactured No 220 Each 478.0000 16 16  
Bushing

Location	Loc Qty	Loc Code
ST066	478	
45402	15	
45918	159	
48268	204	
53779	100	

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Required Date: 7/8/2010

Start Qty: 1.00

Required Qty: 1.00

MS21042L4  
  
 Nut

Purchased No

220 Each

3,188.000 24 24



M115708

Location

Loc Qty

Loc Code

ST139

2

111827

2

ST300

3186

113422

68

114523

110

114718


1000

114784

2000

9063

8

MS21042L5  
  
 Nut

Purchased No

220 Each

695.0000 4 4



M115156 10/3/2010

Location

Loc Qty

Loc Code

ST139

500

114813

500

ST300

195

114449

195

W/O:		WORK ORDER CHANGES					
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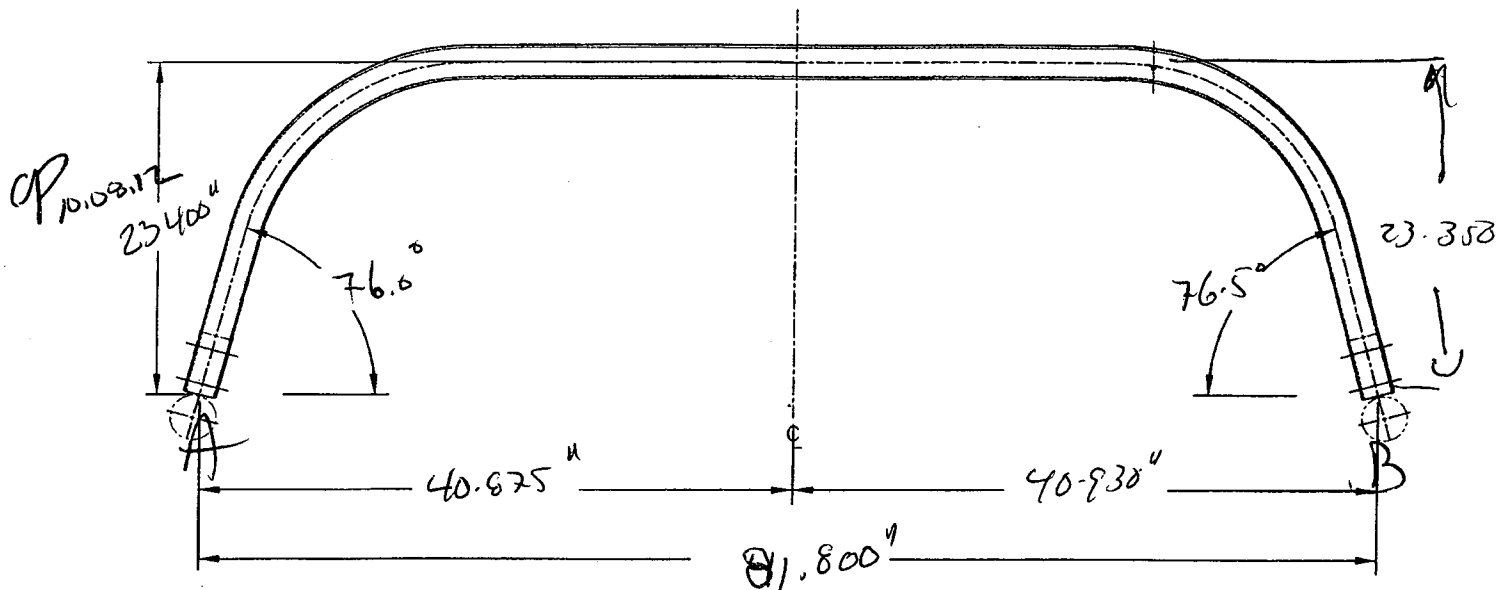
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DART AEROSPACE LTD		Work Order:	59904
Description: Crosstube High Fwd (AS350/355)		Part Number:	D350-748-101
Inspection Dwg: D350-748-141 Rev: D		Page 1 of 1	

Required Dimension	Min	Max
Height	23.13	23.37
1/2 Span	40.78	41.02
Angle	75	77
Total Span	81.56	82.04



Comments
twist .121"
OK CP 10.08.12

QC15 Inspection	8
Date	10/02/12

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	[Signature]

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Item	Qty -141	Part Number	Description
1	X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
2	1	D6017-115	CROSSTUBE
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

# **GENERAL NOTES:**

- 1) MATERIAL: MANUFACTURED FROM D6017-115  
FINISHED LENGTH = 110.270±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2  
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 30.45 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.  
NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY  
RETURN TO  
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SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. *W1059904*  
*RL10-6-14*

**RELEASED**  
2009-10-29  
*my*

E	REVISE GENERAL NOTES; UPDATE TO CURRENT ADD STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); TOLERANCES (ZN C6-3, D1-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6017-115 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>RF</i>	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	<i>RF</i>	DRAWING NO.	REV. E
MFG. APPR.	<i>RF</i>	D350-748-141	SHEET 1 OF 4
APPROVED	<i>RF</i>	TITLE	SCALE
DE APPR.	<i>RF</i>	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

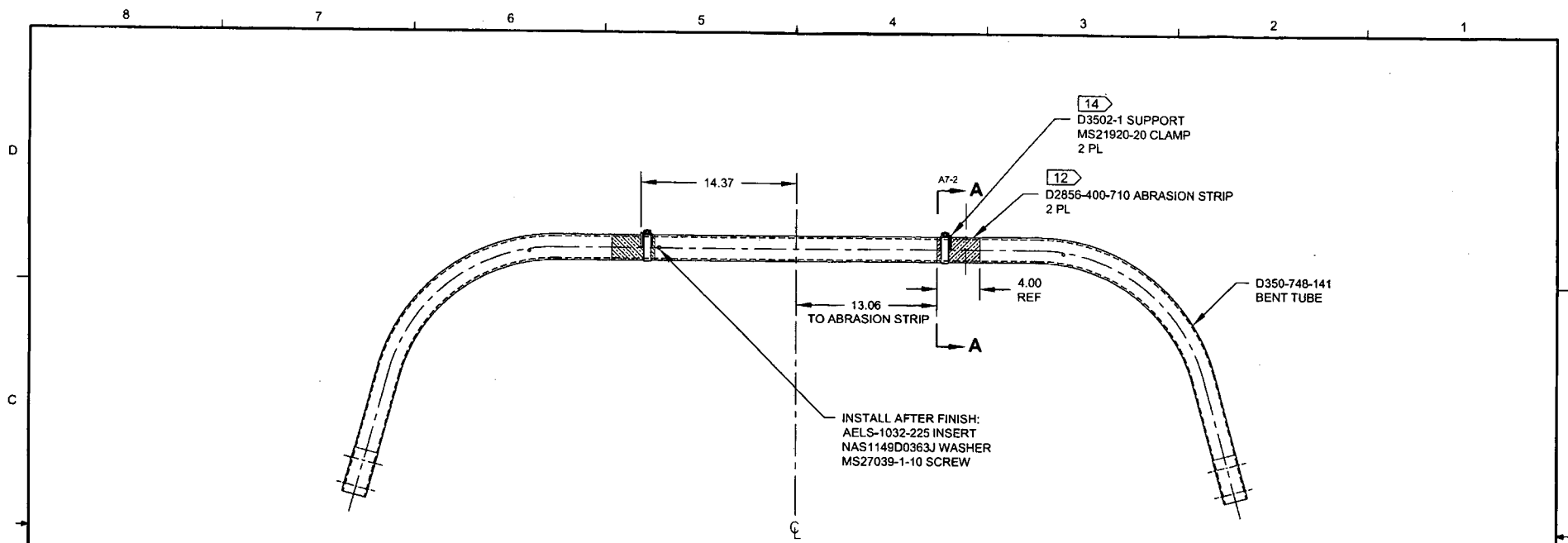
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

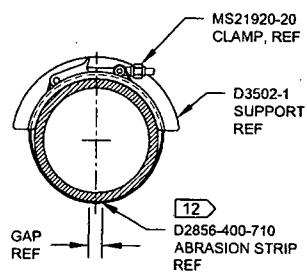
Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



**D350-748-141  
ASSEMBLY DETAIL**



**SECTION A-A D4-2  
SCALE 4X**

*WLO 59909*

**RELEASED**  
2009-10-29

DESIGN	RF	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. E
MFG. APPR.	RF	D350-748-141	SHEET 2 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE (AS 350/355 HI FWD)	NTS
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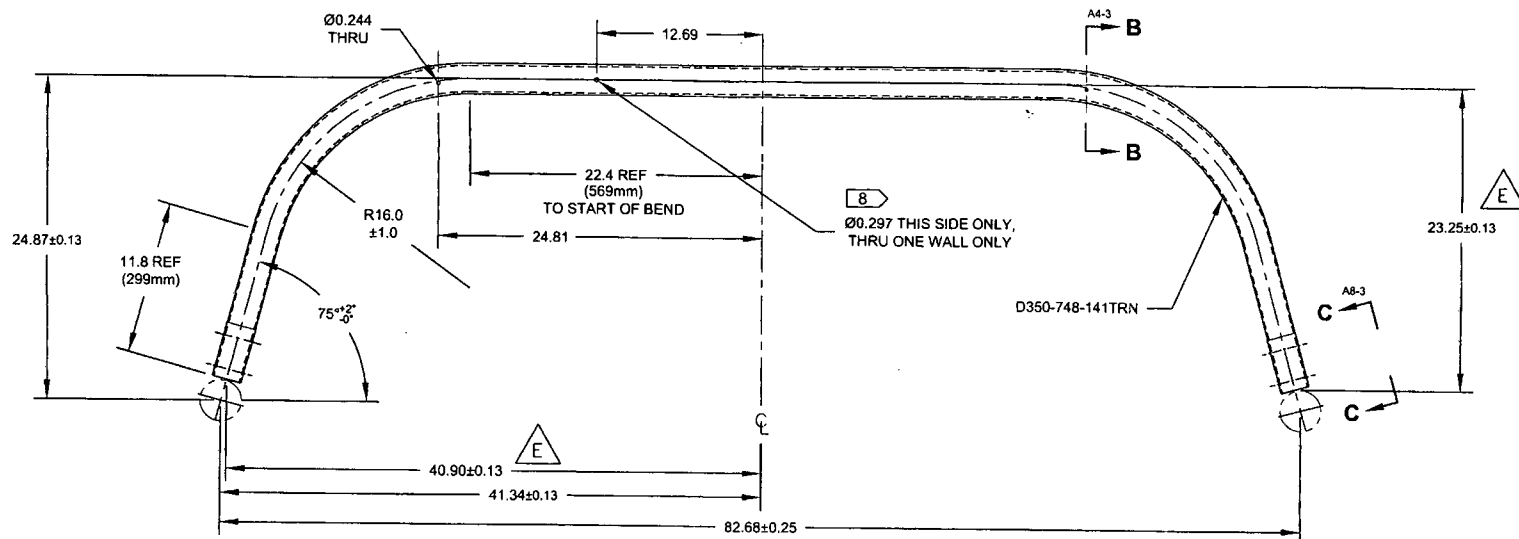
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

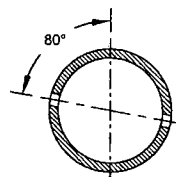
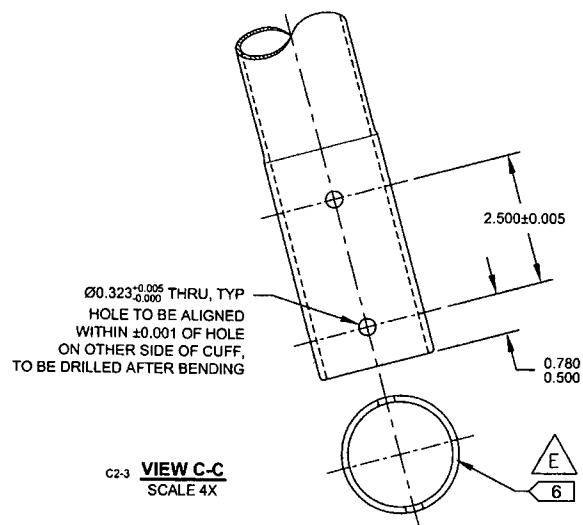
Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



**D350-748-141**  
**BENDING AND DRILLING DETAIL** 10



**SECTION B-B** D3-3  
 SCALE 4X

DESIGN	77	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	77	DRAWING NO.	REV. E
MFG. APPR.	10	D350-748-141	SHEET 3 OF 4
APPROVED	10	TITLE	SCALE
DE APPR.	10	CROSSTUBE (AS 350/355 HI FWD)	NTS
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w659904

**RELEASED**  
 2009-10-29

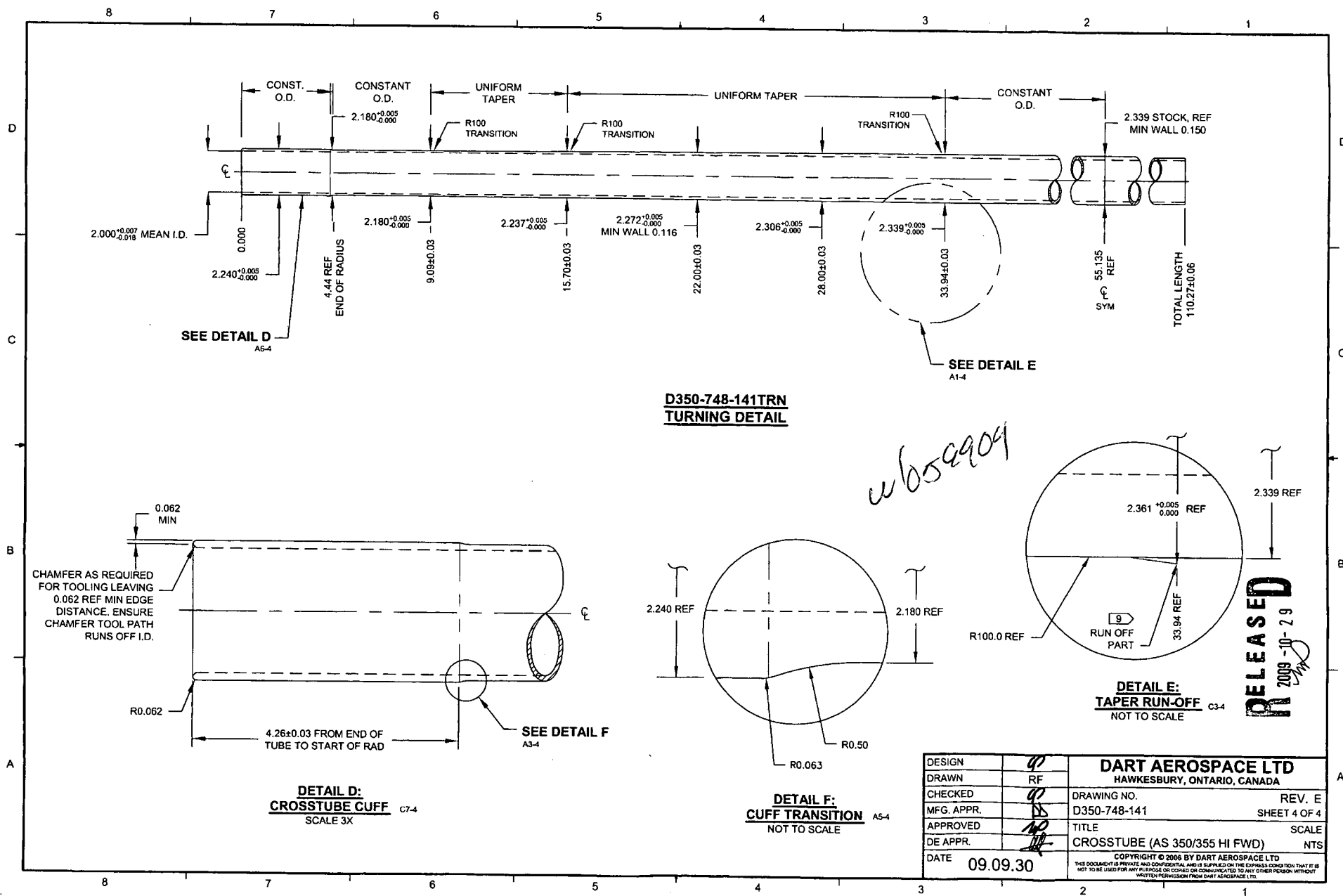
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



**CERTIFICATE OF  
CONFORMANCE**

**CADORATH PLATING CO. LTD.  
2150 LOGAN AVENUE  
WINNIPEG, MANITOBA R2J-0J1**

**DATE:** Aug-31-2010

**CONSIGNED TO:** Dart Aerospace Ltd.  
1270 Aberdeen St.  
Hawksbury, ON K6A 1K7

**W/O #:** 97908

**INVOICE #:** 51056

**CONTRACT OR  
PURCHASE ORDER # PO12422**

**DESCRIPTION:** SKID

**QTY** 1

**P/N #** d350-748-101

**S/N #** B59904

**STRESS RELIEF BAKE @ 375 DEG. HEAT CHART #10-920. MPI IAW  
ASTM-E-1444. CADMIUM PLATED IAW AMS-QQ-P-416C, TYPE 2  
YELLOW, CLASS 2. BAKE HEAT CHART #10-916.**

**CERTIFICATE: I certify that the items indicated here on have  
been inspected and tested and conform to all specifications  
and requirements detailed on the contract or purchase order.**

**Approved Inspector:**



A large, stylized handwritten signature in black ink, written over a horizontal line.



## LIQUID PENETRANT TEST REPORT

P- 15189

CLIENT DART Aerospace DATE SEPT 13-2010 PAGE 1 OF 1  
ATTENTION LINDA/CHANEL ACUREN JOB NO. 108-10-0858  
ADDRESS 1270 ADELPHI STREET. POWO NO. 17412  
HAWKESBURY ON WORK LOCATION HAWKESBURY PLANT  
KOH 1K7 ACCEPTANCE STD. ASTM 1417 REV./DATE 2007  
PROJECT F.P.I. on CROSS TUBES  
ITEM(S) EXAMINED 11

JOB DESCRIPTION PROCEDURE NO. LT-0002 REV./DATE --- TECHNIQUE NO. LT-0002 REV./DATE ---  
PART NO. --- MATERIAL STEEL + [REDACTED] THICKNESS ---  
SCOPE WET FLOUORESCENT LIQUID PENETRANT  
INSPECTION CARRIED OUT 100% EXTERNAL.

## TEST DETAILS

METHOD ☒ FLUORESCENT ☐ VISIBLE ☐ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIED  
FAMILY BRAND MAGNAFLUX BLACK LIGHT S/N 16459 ☐ OUTPUT > 1000  $\mu$ W/cm<sup>2</sup> ☐ AMBIENT < 2 fc  
PENETRANT 2-L67 MINIMUM DWELL TIME 45 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE  
PENETRANT REMOVER H2O MINIMUM DRY TIME >10 MIN. OTHER LAB. NO.  
DEVELOPER SKD 52 MINIMUM DWELL TIME 10 MIN. LIGHT METER S/N 1098866 CAL DUE DATE OCT-1-2010  
DEVELOPER TYPE ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY

## TEST SURFACE

SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE METAL  
SURFACE TEMPERATURE ☐ < -4°C/ 20°F ☐ -4°C/ 20°F TO 10°C/50°F ☒ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)

1 - CROSS TUBE W.O. 59805	✓
1 - CROSS TUBE W.O. 60815	✓
1 - CROSS TUBE W.O. 59907	✓
1 - CROSS TUBE W.O. 60816	✓
1 - CROSS TUBE W.O. 59905	✓
1 - CROSS TUBE W.O. 60820	✓
1 - CROSS TUBE W.O. 60821	✓
1 - CROSS TUBE W.O. 60822	✓
1 - CROSS TUBE W.O. 60817	✓
1 - CROSS TUBE W.O. 60818	✓
1 - CROSS TUBE W.O. 59904	✓
1 - CROSS TUBE W.O. 59906	✓

- EXAMINATION WAS COMPLETED PRIOR TO DEFLECTION TESTING

mm 10 09 17

## Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

## Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

## SIGNATURES

CLIENT REPRESENTATIVE Don Tiffley DTR # E63387  
TECHNICIAN (SIGNATURE): [Signature] SIGNATURE  
NAME (PRINT): Mike Johnston REPORT REVIEWED BY:  
NAME INITIALS  
CGSB LEVEL I SNT LEVEL --- CGSB LEVEL --- SNT LEVEL ---  
CGSB REG. NO. 6606 CGSB REG. NO. ---



## LIQUID PENETRANT TEST REPORT

P- 15191

CLIENT	<u>DART Aerospace</u>	DATE	<u>SEP 13-2010</u>	PAGE	<u>1</u>	OF	<u>1</u>
ATTENTION	<u>LINDA/CHANTEL</u>	ACUREN JOB No.	<u>188-10-0838</u>	TIME	AM <input checked="" type="checkbox"/>	PM <input type="checkbox"/>	
ADDRESS	<u>1270 ABERDEEN STREET</u>	PO/WO No.	<u>12422</u>				
	<u>HAWKESBURY, ON.</u>	WORK LOCATION	<u>HAWKESBURY PLANT</u>				
	<u>KOH 1K7</u>	ACCEPTANCE STD.	<u>ASTM 1417</u>	REV./DATE	<u>2007</u>		
PROJECT	<u>F.P.I.</u>	<u>ON</u>	<u>CROSS TUBES</u>				
ITEM(S) EXAMINED		<u>12</u>					

JOB DESCRIPTION	PROCEDURE No. <u>LT 0002</u>	REV./DATE	<u>-</u>	TECHNIQUE No. <u>LT 1417</u>	REV./DATE	<u>-</u>
PART No.	<u>-</u>	MATERIAL	<u>STEEL</u>	THICKNESS	<u>-</u>	
SCOPE	<u>WET FLUORESCENT LIQUID PENETRANT</u> <u>INSPECTION CARRIED OUT 100% EXTERNAL</u>					

TEST DETAILS					
METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED
FAMILY BRAND	<u>MAGNAFLUX</u>		BLACK LIGHT S/N <u>16459</u>	<input type="checkbox"/> OUTPUT > 1000 $\mu$ W/cm <sup>2</sup>	<input type="checkbox"/> AMBIENT < 2 fc
PENETRANT	<u>2L07</u>	MINIMUM DWELL TIME <u>45</u>	MIN.	LIGHTING EQUIP. <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT	<input type="checkbox"/> OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER	<u>H2O</u>	MINIMUM DRY TIME <u>&gt;10</u>	MIN.	OTHER <u>LABINO</u>	
DEVELOPER	<u>SKD 52</u>	MINIMUM DWELL TIME <u>10</u>	MIN.	LIGHT METER S/N <u>1098866</u>	CAL DUE DATE <u>OCT 19 2010</u>
DEVELOPER TYPE	<input checked="" type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY		

TEST SURFACE					
SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input checked="" type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input checked="" type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/ 20°F	<input type="checkbox"/> -4°C/ 20°F TO 10°C/50°F	<input type="checkbox"/> 10°C/50°F TO 52°C/125°F	<input type="checkbox"/> > 52°C/125°F	

RESULTS- (☐ METRIC ☐ IMPERIAL)

1	CROSSTUBE W.O. 59905	✓
1	CROSSTUBE W.O. 60815	✓
1	CROSSTUBE W.O. 59907	✓
1	CROSSTUBE W.O. 60816	✓
1	CROSSTUBE W.O. 60820	✓
1	CROSSTUBE W.O. 60821	✓
1	CROSSTUBE W.O. 60822	✓
1	CROSSTUBE W.O. 60817	✓
1	CROSSTUBE W.O. 60818	✓
1	CROSSTUBE W.O. 59904	✓
1	CROSSTUBE W.O. 59906	✓

- EXAMINATION WAS COMPLETED

\* AFTER DEFLECTION

TESTING

MM 10-09-17

## Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

## Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

## SIGNATURES

CLIENT REPRESENTATIVE	<u>[Signature]</u>	DTR #	<u>E63387</u>
TECHNICIAN (SIGNATURE):	<u>[Signature]</u>	REPORT REVIEWED BY:	
NAME (PRINT):	<u>Mike Johnston</u>	NAME	INITIALS
CGSB LEVEL	<u>1<sup>st</sup> TECHNICIAN</u>	CGSB LEVEL	<u>2<sup>nd</sup> TECHNICIAN</u>
CGSB REG. No	<u>6606</u>	CGSB REG. No	

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CANARY - OFFICE COPY

PINK - TECHNICIAN COPY

GOLD - OFFICE COPY

## 5.0 PARTS LIST

Qty -101	Qty -201	Part Number	Description
X		D350-748-101	CROSSTUBE INSTALLATION, AS 350/355 HIGH FWD
	X	D350-748-201	CROSSTUBE INSTALLATION, AS 350/355 HIGH AFT
1		D350-748-141	CROSSTUBE ASSEMBLY, AS 350/355 HIGH FWD
	1	D350-748-241	CROSSTUBE ASSEMBLY, AS 350/355 HIGH AFT
*2	*2	D3502-1	SUPPORT
*2	*2	D2856-400-710	ABRASION STRIP
*1	*1	AELS-1032-225	INSERT
*2	*2	MS21920-20	CLAMP
*1	*1	MS27039-1-10	SCREW
*1	*1	AN960JD10	WASHER
4	4	D3500-1	SADDLE
16	16	D3501-1	BUSHING
16	16	AN4-6A	BOLT
8	8	AN4-41A	BOLT
4	4	AN5-32A	BOLT
32	32	AN960JD416	WASHER
8	8	AN960JD516	WASHER
24	24	MS21042L4	NUT (OR MS21042-4)
4	4	MS21042L5	NUT (OR MS21042-5)

\* REFERENCE ONLY. PARTS ARE INCLUDED IN D350-748-141/241 ASSEMBLIES ABOVE

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Revision: B

Date: 07.06.15